



Research Paper

GLOBAL WARMING AS CUL DE SAC

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Abstract

Humanity goes deeper into the dead alley of energy - emissions - temperature rise. The demand for energy is rising as poor countries wish to raise living standards, at the time as their population grows fast. Rich countries have plans for economic growth for next decade as well as large infrastructure projects that require polluting cement. Renewables cannot possibly deliver this additional energy. EV or HYBRIDS reduce fossil fuels but it is marginal.

Key words: Dead End, Hawking's Irreversibility, Eliminating Coal Power, 20 dominating nations.

INTRODUCTION

Mankind has put itself into a "cul de sac" - dead ally from which it cannot escape. By raising the consumption of fossil fuel energy to very high levels it has gained huge advances in material well-being, especially in Europe and east Asia. These advancements now come back as the externality of global emissions driving the greenhouse outcome. The biggest countries in the world carry the largest externalities, although they are not in the forefront of the struggle against climate change (Table 1).

Table 1. Top 20 Energy consuming, CO2 emitting, and coal power producing nations of the world (Enerdata 2019, Crippa et.al. 2019)

Top 20 Energy Consuming Countries 2018	Top 20 CO2 Emitting Countries 2018	Top 20 producers of coal energy 2019
China	China	China
United States	United States	United States
India	India	India
Russia	Russia	Russia
Japan	Japan	Japan
South Korea	Germany	Germany
Germany	Iran	South Africa
Canada	South Korea	South Korea
Brazil	Saudi Arabia	Indonesia

Iran	Canada	Poland
Indonesia	Indonesia	Australia
France	Brazil	Ukraine
Saudi Arabia	Mexico	Turkey
Mexico	South Africa	Vietnam
United Kingdom	Turkey	Taiwan
Nigeria	Australia	Malaysia
Italy	United Kingdom	Kazakhstan
Turkey	Italy	Spain
Thailand	Poland	United Kingdom
South Africa	France	Philippines
Share of World: 75.2 %	Share of World: 78.5 %	Share of World: 93,8 %

Commenting on Table 1, one may quote George Tyler from Social Europe (Social Europe 2020): “Yet too many leaders—such as India’s Narendra Modi, China’s Xi Jinping and America’s Donald Trump—pay only lip-service to, or dismiss entirely, the externalities of GHG emissions, convinced their economic and social costs lie far in the future.”

EXTERNALITIES

Climate change is from the point of view of economics a set of external effects – according to world class economist Nicholas Stern the greatest externality ever encountered for the oceans of Planet Earth. Both Stern and Tyler recommend economic incentives for cutting CO2 emissions. More efficient, however, would be the political recommendation of law: obligate all countries to eliminate coal fired power plants within a year. No person could argue that the countries listed in table 1 could not afford such a measure, as they are some of the most affluent nations in the world. Table 2 provides an estimate of the effort involved, measured by the number of world leading solar plants each country would need to replace the energy currently produced by coal fired plants.

Table 2. Number of solar plants required to substitute coal-fired plants by country [Global Energy Monitor].

Country	Number of plants
Asia:	
China	475
India	100
Japan	28

South Korea	18
Turkey	9

Americas

United States	106
Canada	6

Europe:

Germany	32
Russia	30

Africa:

South Africa	14
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A COMMON POOL REGIME

Considering the failure of the set of COP meetings by the United Nations, it is hard to understand Stern's optimism: "There are ways to reduce the risks of climate change. With the right incentives, the private sector will respond and can deliver solutions. The stabilisation of greenhouse gas concentrations in the atmosphere is feasible, at significant but manageable costs. The policy tools exist to create the incentives required to change investment patterns and move the global economy onto a low-carbon path. This must go hand-in-hand with increased action to adapt to the impacts of the climate change that can no longer be avoided. Above all, reducing the risks of climate change requires collective action. It requires co-operation between countries, through international frameworks that support the achievement of shared goals. It requires a partnership between the public and private sector, working with civil society and with individuals. It is still possible to avoid the worst impacts of climate change; but it requires strong and urgent collective action. Delay would be costly and dangerous." (Stern 2006)

Speaking frankly, this seems quite naïve: Stern bypassing opportunism and dynamic gaming. It is as if he has forgotten the wisdom of the greatest British philosopher of all time: "It is not wisdom but Authority that makes a law" (Hobbes 2012).

CONCLUSION

Stern and Tyler both hope that we can stabilize CO₂ atmospheric concentration at somewhere between 410 and 450 ppm. Various models of climate change predict different points of stabilization (e.g. Nordhaus 2016). These models don't seem realistic,

though. Let us look at present trends, not likely to change very much in the near future. Regression line for the experimental relationship Energy consumption and CO₂:

$$CO_2 \text{ concentration / ppm} = 267.5 + 10 * (\text{World Energy Consumption / btoe}) \quad (1)$$

And moreover, CO₂ emissions have been estimated raise temperatures as follows:

$$\text{Temperature Increase / (degrees centigrade)} = -3.4 + 0.0106 * (\text{CO}_2 \text{ conc. / ppm}) \quad (2)$$

Employing these two regression equations Planet Earth would be in the situation in Table 3.

Table 3. Temperature Increase Scenarios based on Global Energy Projections.

Global Energy / btoe	CO ₂ concentration / PPM	Temperature rise / degrees C
16	430	1.1
18	450	1.3
20	470	1.5
22	490	1.7
24	510	2.0

As Tyler has emphasized, new carbon power plants in many countries of median income. We will rapidly move towards levels around 500-550 ppm or even more if this should become a reality. There is no stabilization point.

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